

**We claim:**

1 1. A method of communicating data between a device and a  
2 host apparatus through a USB interface comprising the steps of:  
3 transmitting a first packet from the device to the host  
4 apparatus, the first packet being erroneously recognized by the host  
5 apparatus as a first type of packet;  
6 receiving a second packet from the host apparatus at the  
7 device in response to the first packet; and  
8 transmitting a third packet from the device to the host  
9 apparatus, the third packet being the first type of packet, in  
10 response to receiving the second packet from the host apparatus.

1 2. The method of claim 1, wherein the first type of packet is a  
2 STALL packet.

1 3. The method of claim 2, wherein the second packet is a clear  
2 feature command packet.

1 4. The method of claim 3, wherein the method further  
2 comprises the step of:  
3 receiving a fourth packet from the host apparatus at the  
4 device, the fourth packet being a clear feature command packet, the  
5 fourth packet transmitted from the host apparatus in response to  
6 receiving the third packet from the device..

1 5. The method of claim 4, wherein the method further  
2 comprises the step of:  
3 transmitting status information from the device to the host  
4 apparatus, in response to receiving the fourth packet from the host  
5 apparatus.

1 6. The method of claim 5, wherein a type of the first packet  
2 transmitted from the device is an ACK packet or a NAK packet.

1 7. The method of claim 6, wherein the data communications is  
2 performed using USB Mass Storage Class Bulk Only Mode.

1 8. A method of communicating data between a device and a  
2 host apparatus through a USB interface comprising the steps of:  
3 transmitting a first request for data from the host apparatus  
4 to the device;  
5 receiving a first packet from the device at the host apparatus  
6 in response to the first request for data;

7           transmitting a second request for data from the host  
8   apparatus to the device, in response to receiving the first packet  
9   from the device; and  
10          receiving a second packet from the device at the host  
11   apparatus in response to the second request for data;

1   9.     The method of claim 8, wherein the first packet is  
2   transmitted from the device as an ACK packet or a NAK packet, but  
3   the host apparatus erroneously recognizes the first packet as a  
4   STALL packet.

1   10.    The method of claim 9, wherein the second packet is a  
2   STALL packet.

1   11.    The method of claim 10, wherein the method further  
2   comprises the step of:  
3          transmitting a clear feature command packet from the host  
4   apparatus to the device, in response to receiving the second packet  
5   from the device..

1   12.    The method of claim 11, wherein the method further  
2   comprises the step of:  
3          receiving status information from the device at the host

4 apparatus, the status information transmitted from the device in  
5 response to receiving the clear feature command packet from the  
6 host apparatus.

1 13. The method of claim 6, wherein the data communications is  
2 performed using USB Mass Storage Class Bulk Only Mode.

1 14. A method of communicating data between a device and a  
2 host apparatus through a USB interface comprising the steps of:  
3 counting a number of STALL packets transmitted from the  
4 device to the host apparatus;  
5 counting a number of clear feature command packets  
6 received from the host apparatus; and  
7 determining a number of times a phase failure has occurred  
8 based on the difference between the number of STALL packets  
9 transmitted from the device to the host apparatus and the number of  
10 clear feature command packets received from the host apparatus.

1 15. The method of claim 14, further comprising the step of:  
2 using the number of times a phase failure has occurred to  
3 perform self-diagnosis of the device.

1 16. The method of claim 15, wherein the step of using the  
2 number of times a phase failure has occurred to perform self-  
3 diagnosis of the device comprises the step of:  
4 displaying an alarm on the device based on the number of  
5 times a phase failure has occurred.

1 17. The method of claim 15, wherein the step of using the  
2 number of times a phase failure has occurred to perform self-  
3 diagnosis of the device comprises the step of:  
4 displaying an alarm on the host apparatus based on the  
5 number of times a phase failure has occurred.

1 18. In a device operable to communicate data with a host  
2 apparatus through a USB interface, apparatus comprising:  
3 a packet detector operable to detect a second packet from the  
4 host apparatus, the second packet transmitted from the host device  
5 in response the host device receiving a first packet from the device,  
6 the first packet being erroneously recognized by the host apparatus  
7 as a first type of packet; and  
8 a packet transmitter operable to transmit a third packet to the  
9 host apparatus, the third packet being the first type of packet, in  
10 response to receiving the second packet from the host apparatus.

1 19. The apparatus of claim 18, wherein the first type of packet is  
2 a STALL packet.

1 20. The apparatus of claim 19, wherein the second packet is a  
2 clear feature command packet.

1 21. The apparatus of claim 20, wherein the packet detector is  
2 further operable to receive a fourth packet from the host apparatus,  
3 the fourth packet being a clear feature command packet, the fourth  
4 packet transmitted from the host apparatus in response to receiving  
5 the third packet from the device..

1 22. The apparatus of claim 21, further comprising:  
2 circuitry operable to transmit status information to the host  
3 apparatus, in response to receiving the fourth packet from the host  
4 apparatus.

1 23. The apparatus of claim 22, wherein a type of the first packet  
2 transmitted from the device is an ACK packet or a NAK packet.

1 24. The apparatus of claim 23, wherein the data communications  
2 is performed using USB Mass Storage Class Bulk Only Mode.

1 25. In a host apparatus operable to communicate data with a  
2 device through a USB interface, apparatus comprising:  
3 transmitting circuitry operable to transmit a first request for  
4 data to the device;  
5 receiving circuitry operable to receive a first packet from the  
6 device in response to the first request for data;  
7 transmitting circuitry operable to transmit a second request  
8 for data to the device, in response to receiving the first packet from  
9 the device; and  
10 receiving circuitry operable to receive a second packet from  
11 the device in response to the second request for data.

1 26. The apparatus of claim 25, wherein the first packet is  
2 transmitted from the device as an ACK packet or a NAK packet, but  
3 the host apparatus erroneously recognizes the first packet as a  
4 STALL packet.

1 27. The apparatus of claim 26, wherein the second packet is a  
2 STALL packet.

1 28. The apparatus of claim 27, wherein the apparatus further  
2 comprises:  
3 transmitting circuitry operable to transmit a clear feature  
4 command packet to the device, in response to receiving the second  
5 packet from the device..

1 29. The apparatus of claim 28, wherein the apparatus further  
2 comprises:  
3 receiving circuitry operable to receive status information  
4 from the device, the status information transmitted from the device  
5 in response to receiving the clear feature command packet from the  
6 host apparatus.

1 30. The apparatus of claim 29, wherein the data communications  
2 is performed using USB Mass Storage Class Bulk Only Mode.

1 31. In a device operable to communicate data with a host  
2 apparatus through a USB interface, apparatus comprising:  
3 a counting unit operable to count a number of STALL  
4 packets transmitted from the device to the host apparatus;  
5 a counting unit operable to count a number of clear feature  
6 command packets received from the host apparatus; and  
7 a determining unit operable to determine a number of times a  
8 phase failure has occurred based on the difference between the



9 number of STALL packets transmitted from the device to the host  
10 apparatus and the number of clear feature command packets  
11 received from the host apparatus.

1 32. The apparatus of claim 14, further comprising:  
2 a self-diagnosis unit operable to use the number of times a  
3 phase failure has occurred to perform self-diagnosis of the device.

1 33. The method of claim 15, wherein the self-diagnosis unit  
2 comprises:  
3 an alarm unit operable to display an alarm on the device  
4 based on the number of times a phase failure has occurred.

1 34. The method of claim 15, wherein the self-diagnosis unit  
2 comprises:  
3 an alarm unit operable to display an alarm on the host  
4 apparatus based on the number of times a phase failure has  
5 occurred.